

SAMSUNG**ELECTRONICS**

Approval



TO : China general

DATE : Oct, 11, 2011

SAMSUNG TFT-LCD**MODEL NO. : LTN140AT20-W**

NOTE : Extension code [-W01]
→ LTN140AT20-W01
- Surface type [**Glare**]

Any modification of Spec is not allowed without SEC's permission

The information described in this SPEC is preliminary and can be changed without prior notice.

APPROVED BY :

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Date	Rev. No.	Page	Summary
Oct.11, 2011	A00	All	The approval specification was issued.

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GENERAL DESCRIPTION

DESCRIPTION

LTN140AT20-W01 is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching devices. This model is composed of a TFT LCD panel, a driver circuit and a backlight unit. The resolution of a 14.0" contains 1,366 x 768 pixels and can display up to 262,144 colors. 6 O'clock direction is the Optimum viewing angle.

FEATURES

- High contrast ratio, high aperture structure
- 1366 x 768 pixels resolution
- Low power consumption
- Fast Response
- LED BLU with LED driver
- DE(Data enable) only mode
- 3.3V LVDS Interface
- Onboard EEDID chip
- Pb-free product

APPLICATIONS

- Notebook PC
- If the usage of this product is not for PC application, but for others, please contact SEC.

GENERAL INFORMATION

Item	Specification	Unit	Note
Display area	309.399(H) x 173.952(V) (14.0" diagonal)	mm	
Driver element	a-Si TFT active matrix		
Display colors	262,144		
Number of pixel	1366 x RGB(3) x 768	pixel	16 : 9
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.2265(H) x 0.2265(V) (TYP.)	mm	
Display Mode	Normally white		
Surface treatment	Haze 0, Hard-Coating 3H		

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Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	319.9	320.4	320.9	mm	(1)
	Vertical (V)	186.6	187.1	187.6	mm	
	Depth (D)	-	-	3.6	mm	
Weight		-	-	330	g	

Note (1) Measurement condition of outline dimension

. Equipment : Vernier Calipers

. Push Force : 150g ·f (minimum)

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Storage temperate	T _{STG}	-20	60	°C	(1)
Operating temperate (Temperature of glass surface)	T _{OPR}	0	50	°C	(1)
Shock (non-operating)	Snop	-	210	G	(2),(5)
			50		(3),(5)
Vibration (non-operating)	Vnop	-	2.41	G	(4),(5)

Note (1) Temperature and relative humidity range are shown in the figure below.

95 % RH Max. (40 °C ≥ Ta)

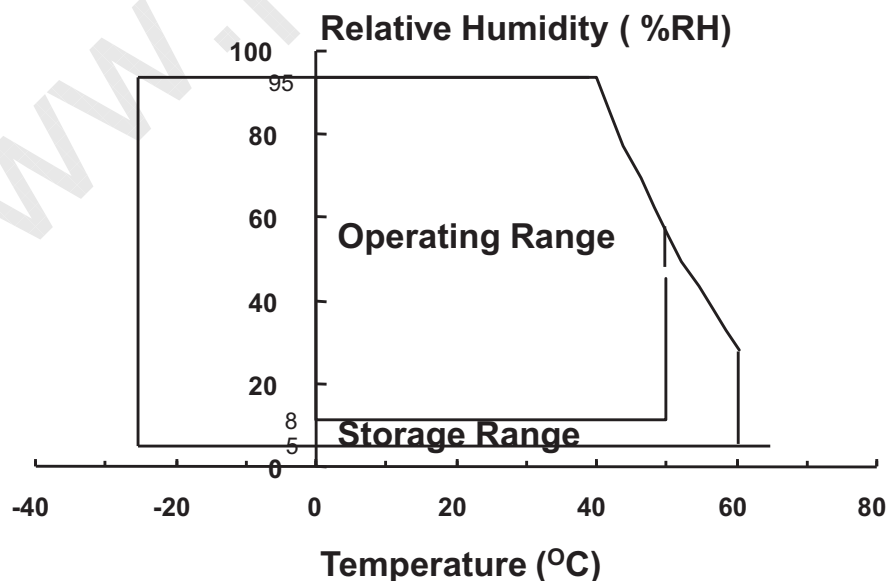
Maximum wet - bulb temperature at 39 °C or less. (Ta > 40 °C) No condensation.

(2) 3ms, half sine wave, one time for ±X, ±Y, ±Z.

(3) 18ms, Trapezoidal wave, one time for ±X, ±Y, ±Z.

(4) 5~500 Hz, Random vibration, 30 min for X,Y,Z.

(5) At testing Vibration and Shock, the fixture in holding the Module to be tested have to be hard and rigid enough so that the Module would not be twisted or bent by the fixture.



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1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

V_{DD} =3.3V, V_{SS} = GND = 0V

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V _{DD}	V _{DD} - 0.3	V _{DD} + 0.3	V	(1)
Logic Input Voltage	V _{IN}	V _{DD} - 0.3	V _{DD} + 0.3	V	(1)

Note (1) Within Ta (25 ± 2 °C)

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2. OPTICAL CHARACTERISTICS

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note (5).
Measuring equipment : TOPCON SR-3

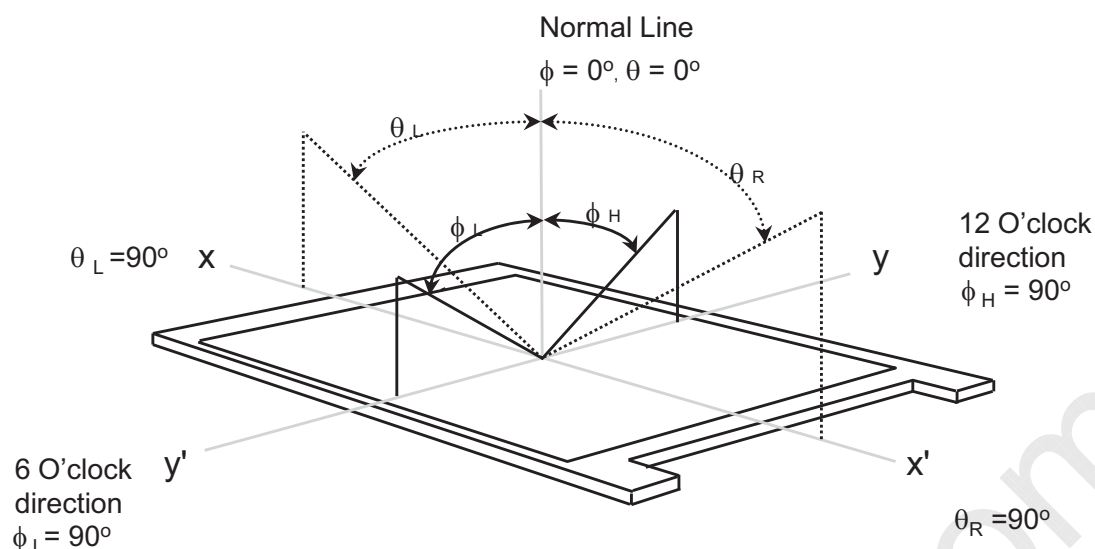
* Ta = 25 ± 2 °C, V_{DD}=3.3V, f_v= 60Hz, f_{DCLK}= (72.33)MHz, I_L = (27) mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR		300	500	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T _{RT,B/W}		-	16	-	msec	(1), (3)
Average Luminance of White (5 Points)		Y _{L,AVE}	Normal Viewing Angle ϕ = 0 θ = 0	170	200	-	cd/m ²	I _L =(27)mA (1), (4)
Color Chromaticity (CIE)	Red	R _X		0.543	0.573	0.603	-	(1), (5) SR-3
		R _Y		0.314	0.344	0.374		
	Green	G _X		0.310	0.340	0.370		
		G _Y		0.532	0.562	0.592		
	Blue	B _X		0.132	0.162	0.192		
		B _Y		0.089	0.119	0.149		
	White	W _X		0.283	0.313	0.343		
		W _Y		0.299	0.329	0.359		
Viewing Angle	Hor.	θ _L	CR ≥ 10	-	45	-	Degrees	(1), (5) SR-3
		θ _R		-	45	-		
	Ver.	ϕ _H		-	15	-		
		ϕ _L		-	30	-		
Color Gamut		CG		-	45	-	%	
13 Points White Variation		δ _L		-	-	1.67	-	(6)
5 Points White Variation		δ _L		-	-	1.25	-	(6)

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Note 1) Definition of Viewing Angle : Viewing angle range($10 \leq C/R$, $100 \leq C/R$)

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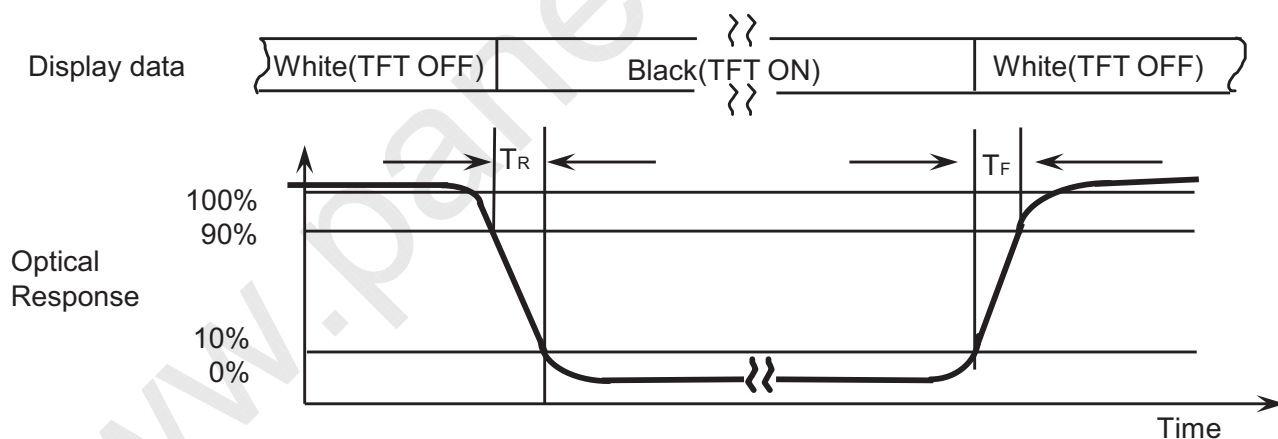


Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

$$CR = \frac{CR(4) + CR(5) + CR(7) + CR(9) + CR(10)}{5}$$

Points : (4) , (5) , (7) , (9) , (10) at the figure of Note (6).

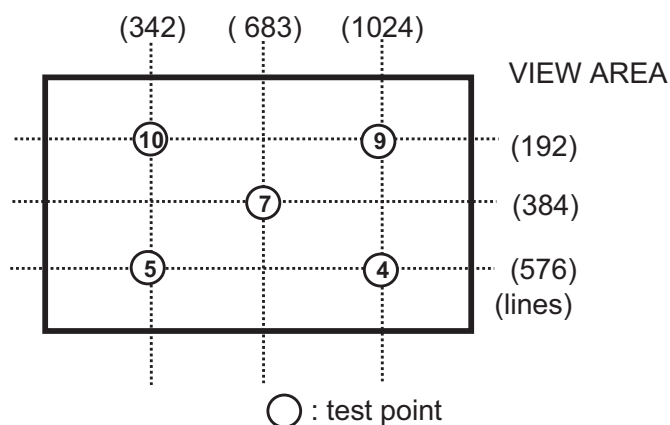
Note 3) Definition of Response time :



Note 4) Definition of Average Luminance of White : measure the luminance of white at 5 points.

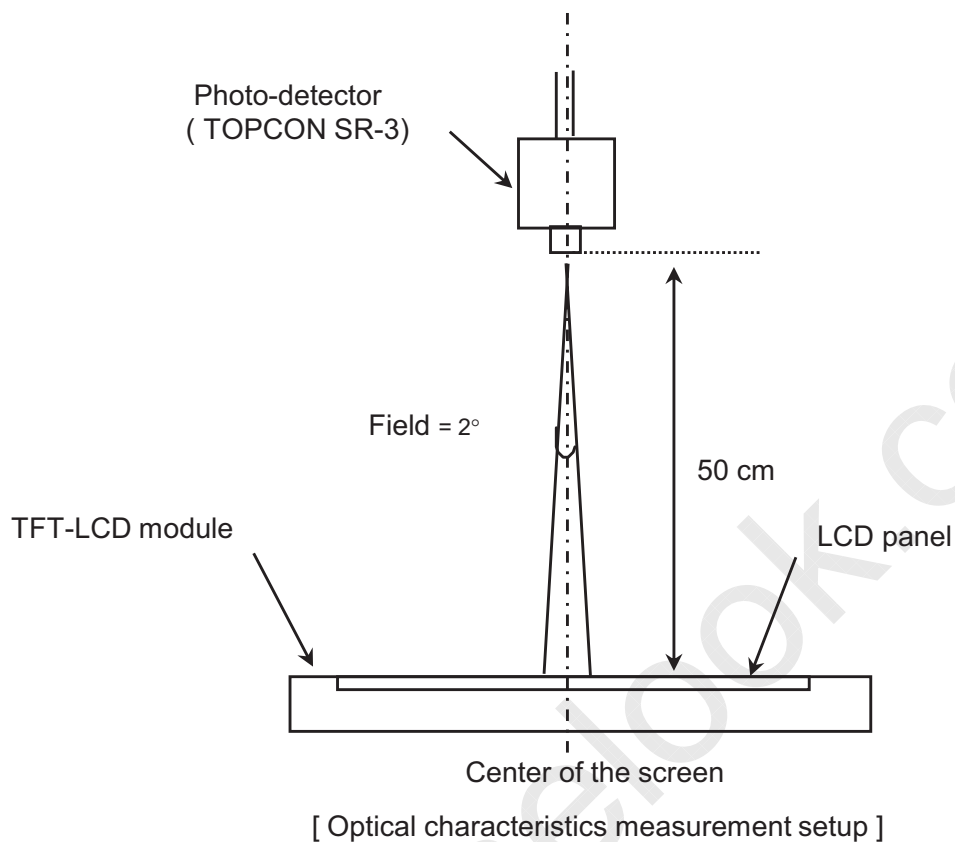
Average Luminance of White ($Y_{L,AVE}$)

$$Y_{L,AVE} = \frac{Y_{L4} + Y_{L5} + Y_{L7} + Y_{L9} + Y_{L10}}{5}$$



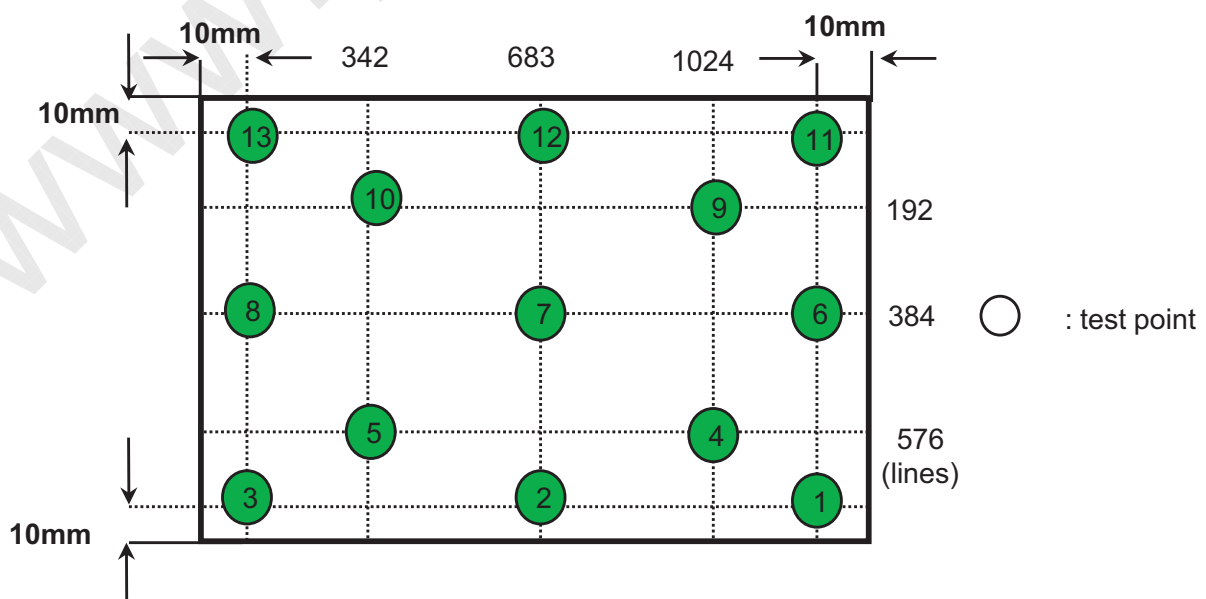
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Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. 30 min after lighting the backlight. This should be measured in the center of screen.
Environment condition : $T_a = 25 \pm 2 \text{ }^{\circ}\text{C}$



Note 6) Definition of 13 points white variation (δ_L), CR variation (C_{VER}) [① ~ ⑬]

$$\delta L = \frac{\text{Maximum luminance of 13 points}}{\text{Minimum luminance of 13 points}}$$



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3. ELECTRICAL CHARACTERISTICS

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3.1 TFT LCD MODULE

Ta= 25 ± 2°C

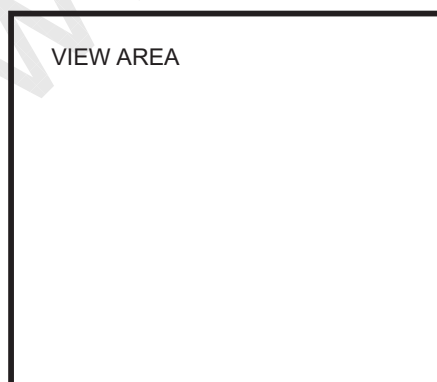
Item			Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply			V _{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold		High	V _{IH}	-	-	+100	mV	V _{CM} = +1.2V
		Low	V _{IL}	-100	-	-	mV	
Vsync Frequency	60Hz	Hsync Freq	F _H	-	91.6	-	KHz	
		Main Freq	F _{DCLK}	-	72.33	-	MHz	
	50Hz	Hsync Freq	F _H	-	76.3	-	KHz	
		Main Freq	F _{DCLK}	-	62.27	-	MHz	
	40Hz	Hsync Freq	F _H	-	61.0	-	KHz	
		Main Freq	F _{DCLK}	-	48.22	-	MHz	
Rush Current			I _{RUSH}	-	-	1.5	A	(4)
Current of Power Supply		White	I _{DD}	-	240	-	mA	(2),(3)*a
		Mosaic		-	230	-	mA	(2),(3)*b
		WinXP Pattern		-	280	-	mA	(2),(3)*c
		Max Pattern		-	-	380	mA	(2),(3)*d

Note (1) Display data pins and timing signal pins should be connected.(GND = 0V)

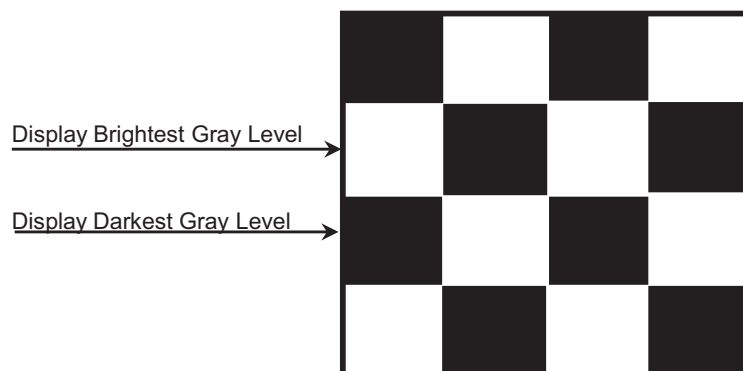
(2) f_V = 60Hz, f_{DCLK} = (72.33)MHZ, V_{DD} = 3.3V , DC Current.

(3) Power dissipation pattern

*a) White Pattern



*b) Mosaic Pattern



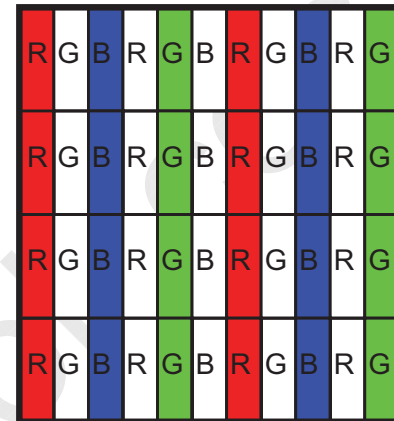
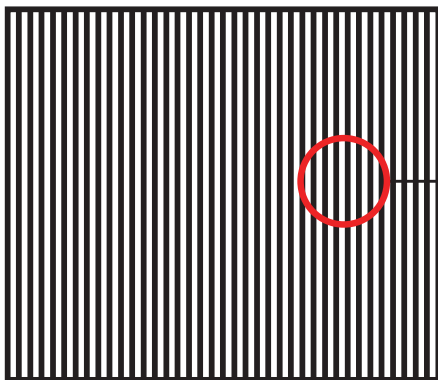
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*c) WinXP Pattern

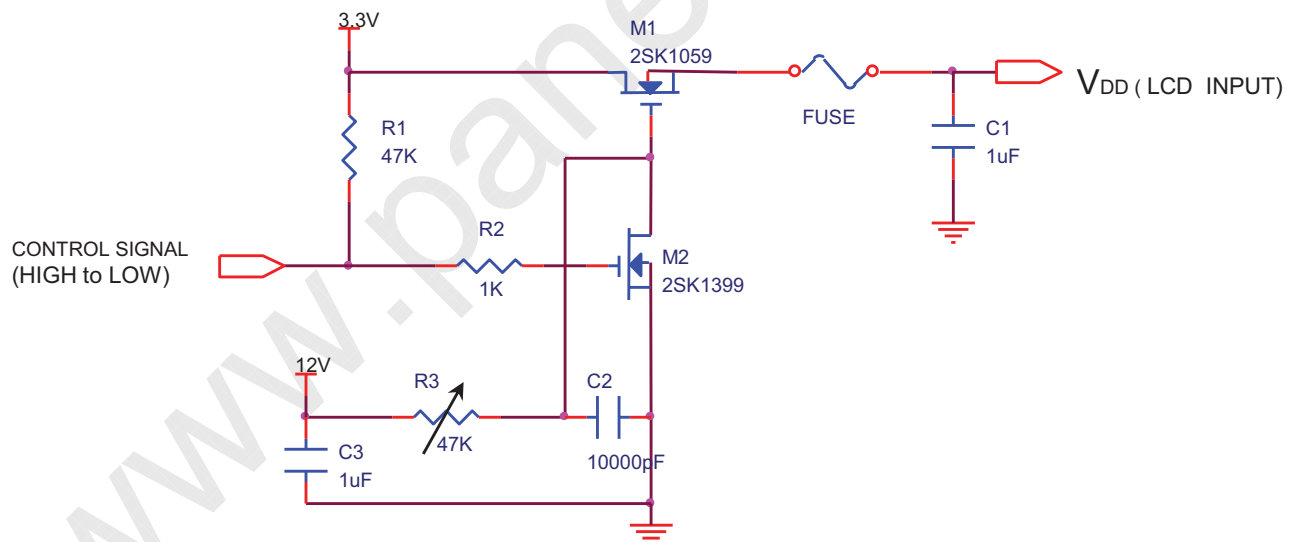
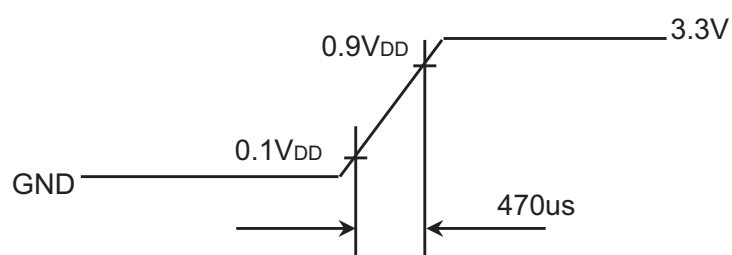


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*d) 1dot Vertical stripe pattern



4) Rush current measurement condition

V_{DD} rising time is 470us**Samsung Secret**

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3.2 Back light unit

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Forward Current	IF	-	23	-	mA	
LED Forward Voltage	VF	-	3.2	3.4	V	IF=27mA
LED Array Voltage	VP	-	32	-	V	VF X 10 LEDs
Power Consumption	P	-	2.6	3.25	W	IF X VF X 30LEDs
Operating Life Time	Hr	10,000	-	-	Hr	(1)

Note (1) Life time (Hr) of LEDs can be defined as the time in which it continues to operate under the condition Ta= 25 ± 2 °C and DC = (23.0) mA until one of the following event occurs.

- When the brightness becomes 50% or lower than the original.

3.3 LED Driver

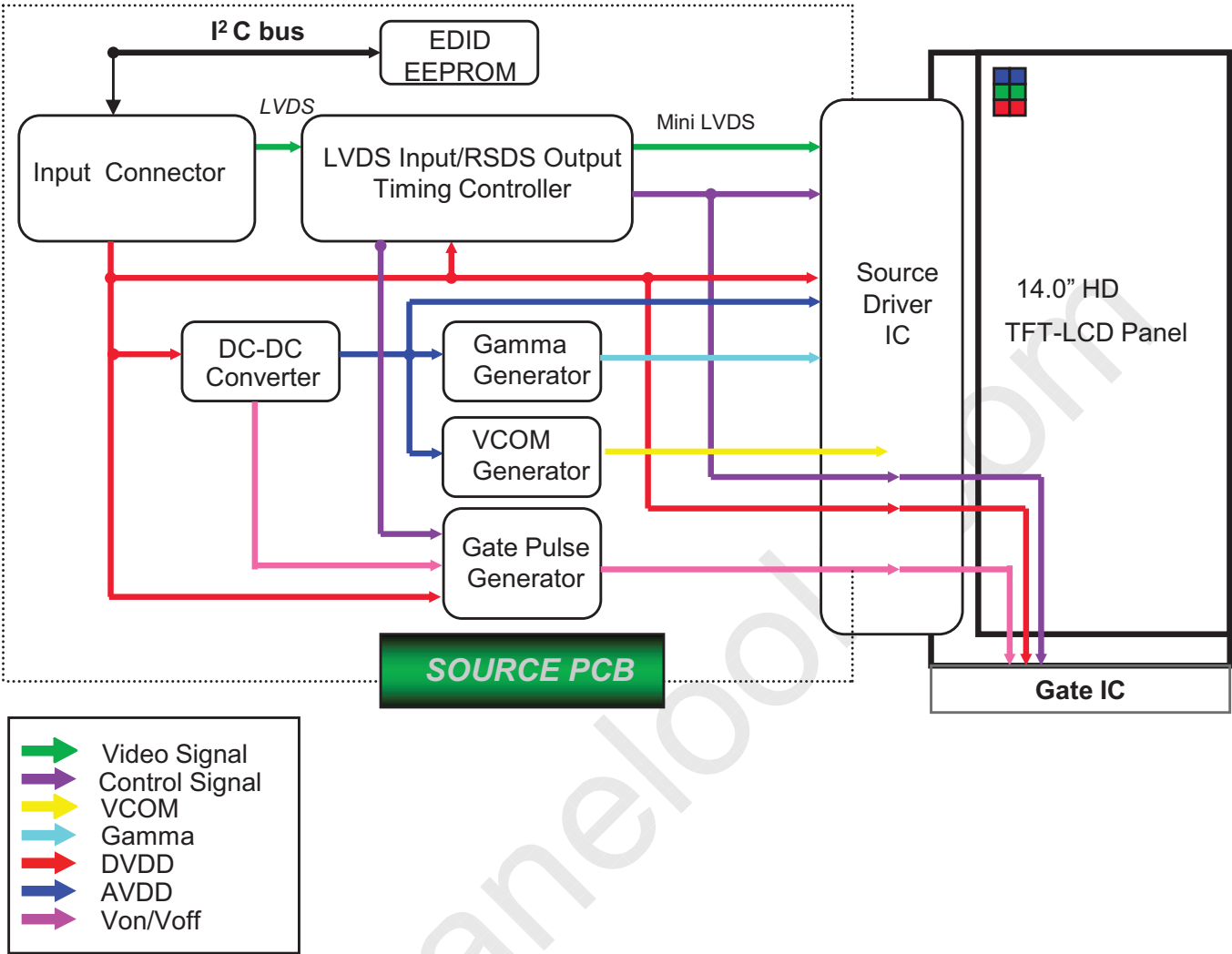
-LED Driver Manufacturer : Intersil

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input Voltage	V _{in}	7	12	21	V	
PWM Duty	D1	1	-	100	%	PWM frequency (120~1khz)
	D2	5	-	100	%	PWM frequency (1~10khz)
	D3	10	-	100	%	PWM frequency (10~30Khz)
Operating Frequency	F _o	675	750	825	KHz	600KHz Possible
PWM Frequency	F _{PWM}	0.12		30	KHz	
Efficiency	η	80			%	

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4. BLOCK DIAGRAM

4.1 TFT LCD Module



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5. INPUT TERMINAL PIN ASSIGNMENT

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5.1. Input Signal & Power (LVDS, Connector : IPEX 20455-040E)

Pin	Symbol	Function
1	NC	No Connection (Reserved for supplier)
2~3	VDD	Logic power 3.3V (Panel logic, BL logic)
4	VEDID	EDID 3.3V power
5	NC	no connect
6	CLK_EDID	EDID clock
7	DATA_EDID	EDID data
8	RXin0-	- LVDS differential data (R0-R5, G0)
9	RXin0+	+ LVDS differential data (R0-R5, G0)
10	GND	Ground
11	RXin1-	- LVDS differential data (G1-G5, B0-B1)
12	RXn1+	+ LVDS differential data (G1-G5, B0-B1)
13	GND	Ground
14	RXin2-	- LVDS differential data (B2-B5,HS,VS, DE)
15	RXn2+	+ LVDS differential data (B2-B5,HS,VS, DE)
16	GND	Ground
17	ClkIN-	- LVDS differential clock input
18	ClkIN+	+ LVDS differential clock input
19	CE_EN	Color Engine enable, High enable
20~21	NC	No Connection
22	GND	Ground
23~24	NC	No Connection
25	GND	Ground
26~27	NC	No Connection
28	GND	Ground
29~30	NC	No Connection
31~33	VBL-	LED Ground
34	NC	No Connection
35	S_PWM	System PWM Signal Input
36	LED_EN	BL On/Off (On: 2.0~3.3V, Off: 0~0.8V)
37	DBC_EN	Dynamic Backlight Control enable (High enable)
38~40	VBL+	LED Power Supply 7V-21V

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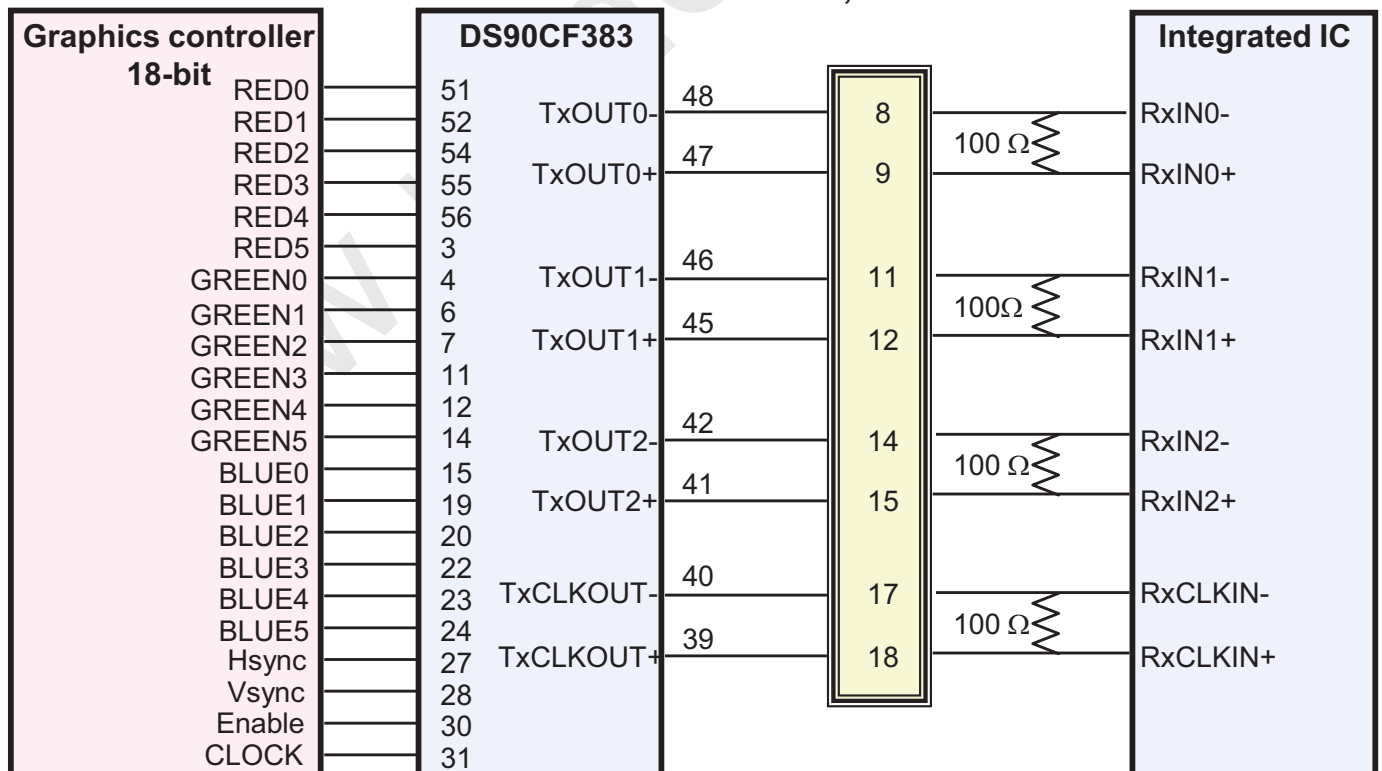
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5.2 LVDS Interface

Pin No.	Name	RGB Signal	Pin No.	Name	RGB Signal
51	TxIN0	R0	14	TxIN14	G5
52	TxIN1	R1	15	TxIN15	B0
54	TxIN2	R2	19	TxIN18	B1
55	TxIN3	R3	20	TxIN19	B2
56	TxIN4	R4	22	TxIN20	B3
3	TxIN6	R5	23	TxIN21	B4
4	TxIN7	G0	24	TxIN22	B5
6	TxIN8	G1	27	TxIN24	Hsync
7	TxIN9	G2	28	TxIN25	Vsync
11	TxIN12	G3	30	TxIN26	DE
12	TxIN13	G4	31	TxCLKIN	Clock

LVDS Interface

I-PEX, 20455-40E



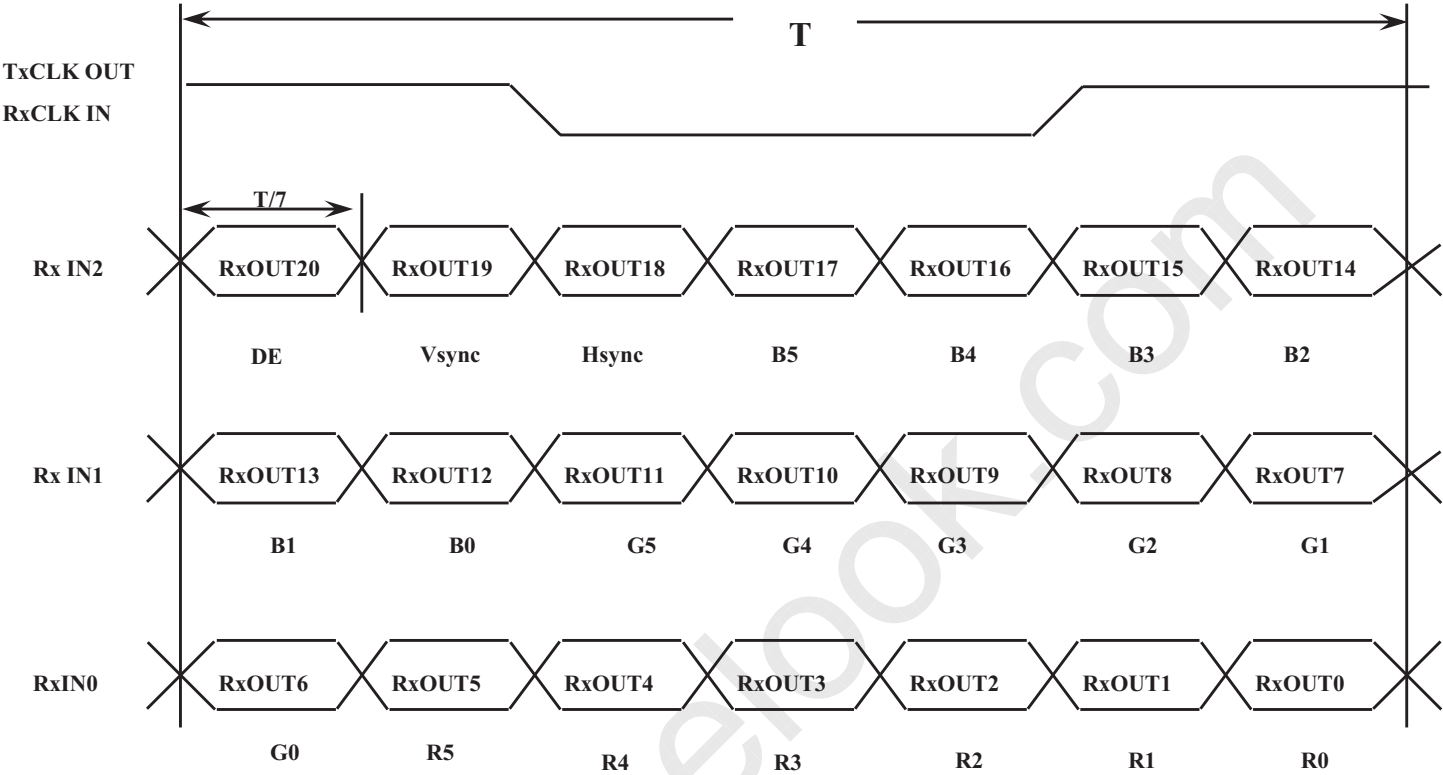
Note : The LCD Module uses a 100ohm resistor between positive and negative lines of each receiver input.

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5.3 Timing Diagrams of LVDS For Transmission

LVDS Receiver : Integrated T-CON



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5.5 Input Signals, Basic Display Colors and Gray Scale of Each Color

Color	Display	Data Signal																		Gray Scale Level
		Red						Green						Blue						
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	45	B5	
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	-
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	-
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	-
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	-
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	-
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
Gray Scale Of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0
	Dark	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1
	↑	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	↓	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R61
	Light	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R62
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R63
Gray Scale Of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0
	Dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	G1
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	G2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	↓	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	G61
	Light	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	G62
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	G63
Gray Scale Of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B1
	↑	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		
	↓	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	B61
	Light	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	B62
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	B63

Note 1) Definition of gray :

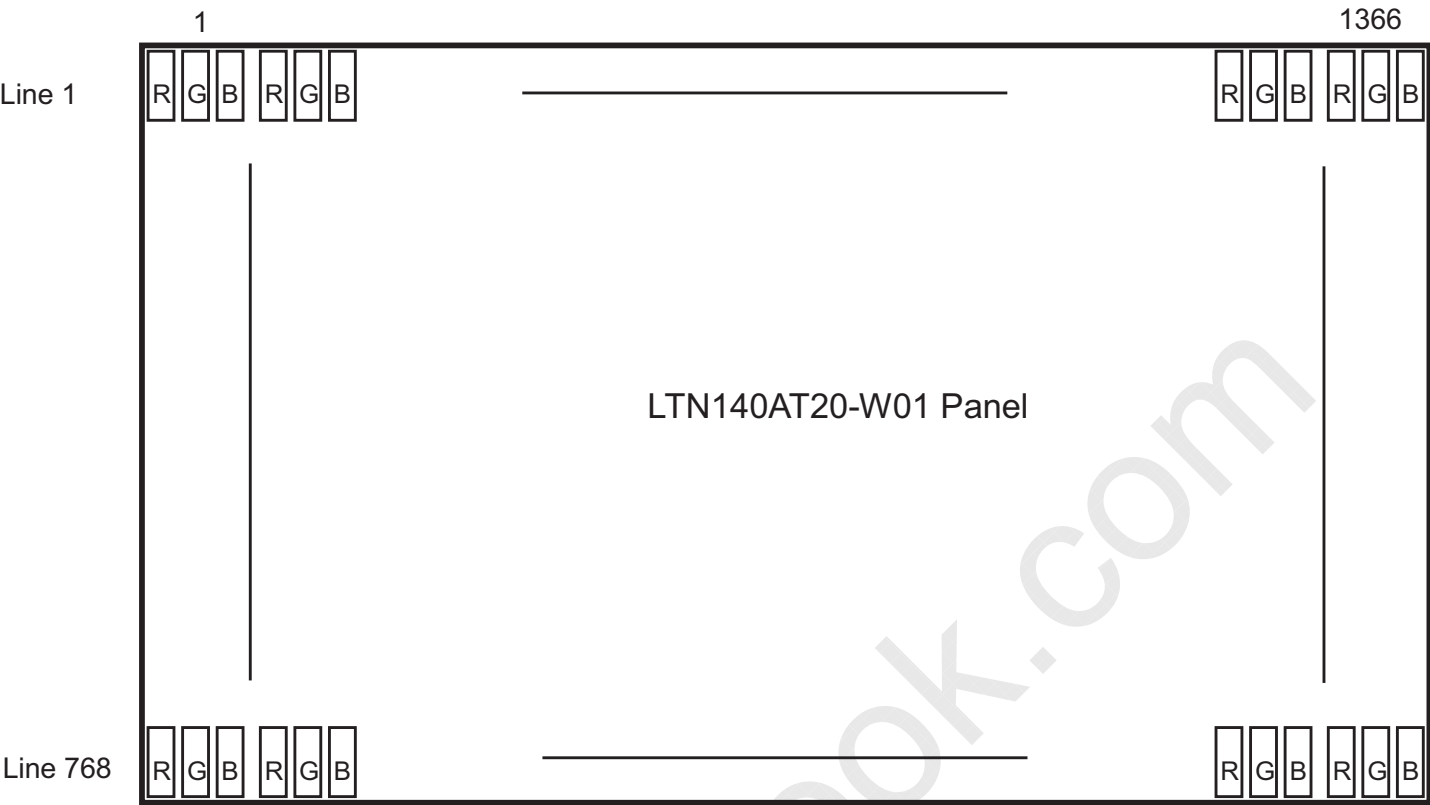
Rn: Red gray, Gn: Green gray, Bn: Blue gray (n=gray level)

Note 2) Input signal: 0 =Low level voltage, 1=High level voltage

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5.6 Pixel Format in the display



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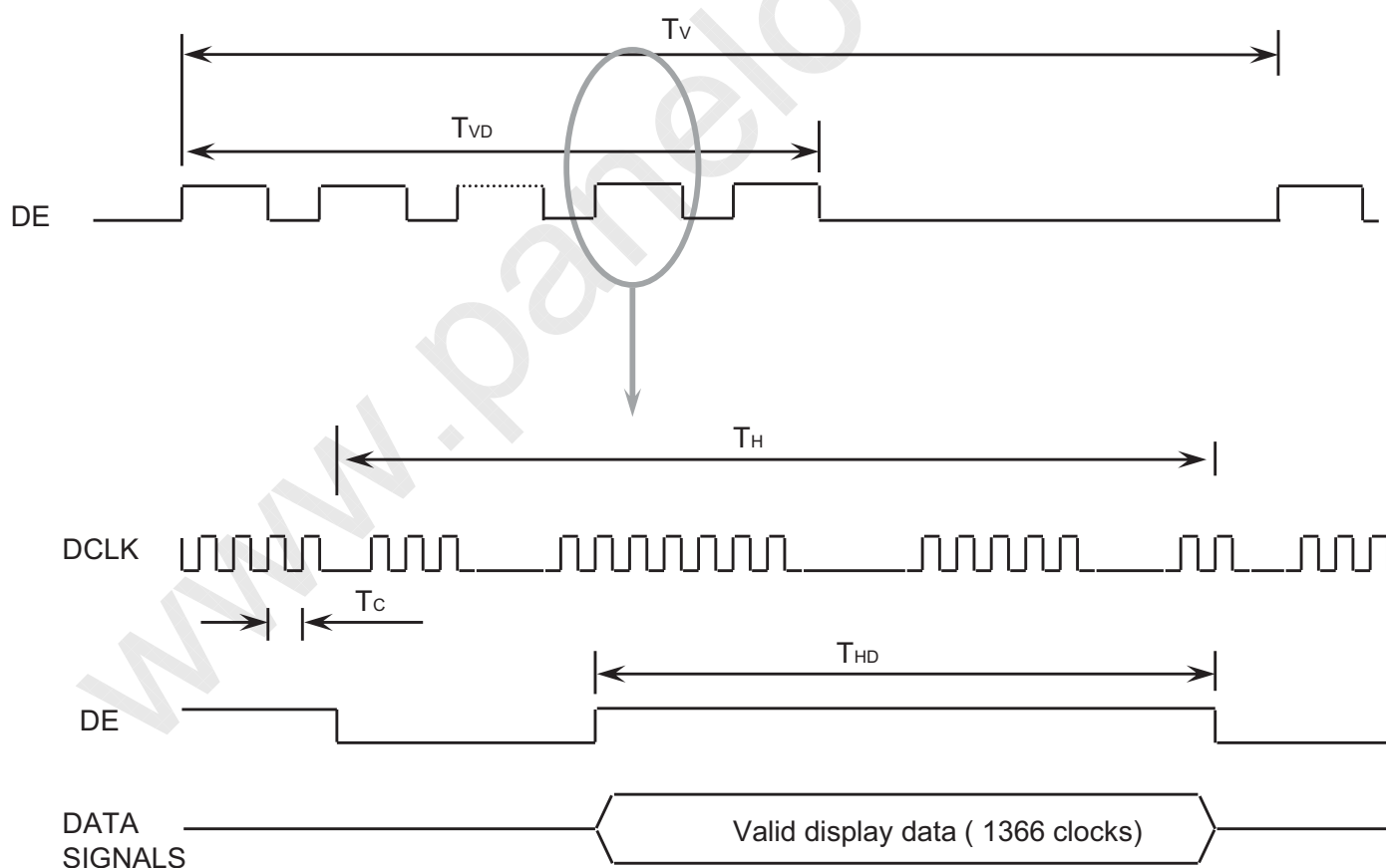
6. INTERFACE TIMING

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6.1 Timing Parameters

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	T_V	780	790	980	Lines	
Vertical Active Display Term	Display Period	T_{VD}	-	768	-	Lines	
One Line Scanning Time	Cycle	T_H	1440	1526	1800	Clocks	
Horizontal Active Display Term	Display Period	T_{HD}	-	1366	-	Clocks	

6.2 Timing diagrams of interface signal

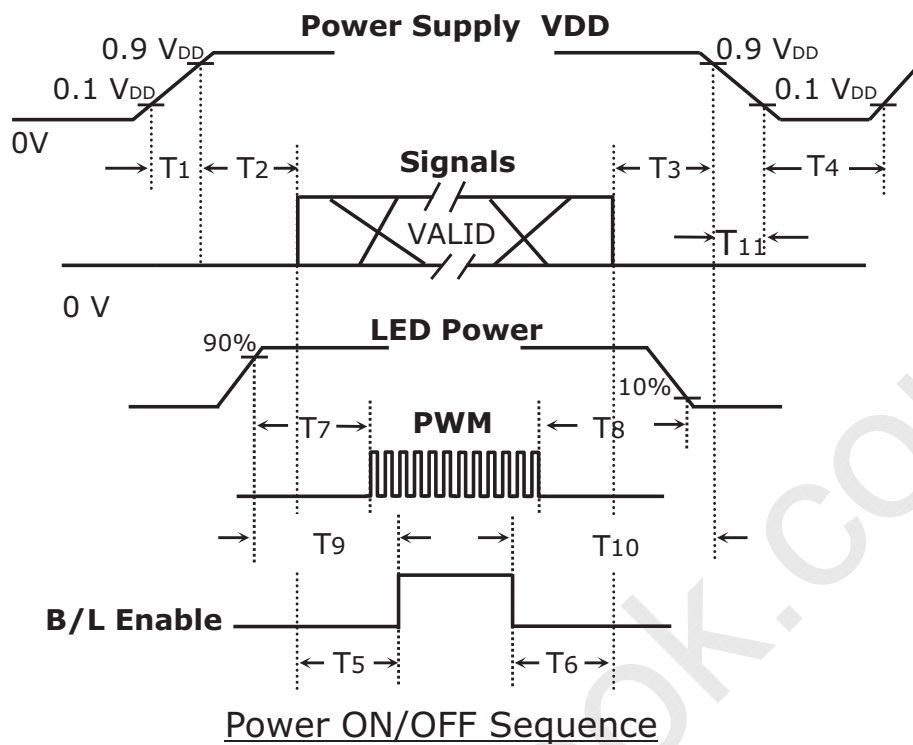


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6.3 Power ON/OFF Sequence

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: To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.



Timing (ms)	Remarks
$0.5 < T_1 \leq 10$	V _{DD} rising time from 10% to 90%
$0 < T_2 \leq 50$	Delay from V _{DD} to valid data at power ON
$0 < T_3$	Delay from valid data OFF to V _{DD} off at power OFF
$150 \leq T_4$	V _{DD} OFF time for Windows restart
$200 \leq T_5$	Delay from valid data to B/L enable at power ON
$0 < T_6$	Delay from valid data off to B/L disable at power OFF
$0 < T_7$	Delay from LED driver power ON to PWM ON
$0 < T_8$	Delay from PWM OFF to LED driver power OFF
$0 < T_9$	Delay from VBL on to B/L Enable ON
$0 < T_{10}$	Delay from B/L Enable Off to VBL OFF
$0 < T_{11} \leq 10$	V _{DD} falling time from 90% to 10%

NOTE.

- (1) The supply voltage of the external system for the module input should be the same as the definition of V_{DD}.
- (2) In case of V_{DD} = off level, please keep the level of input signals on the low or keep a high impedance.
- (3) T₄ should be measured after the module has been fully discharged between power off and on period.
- (4) Interface signal shall not be kept at high impedance when the power is on.

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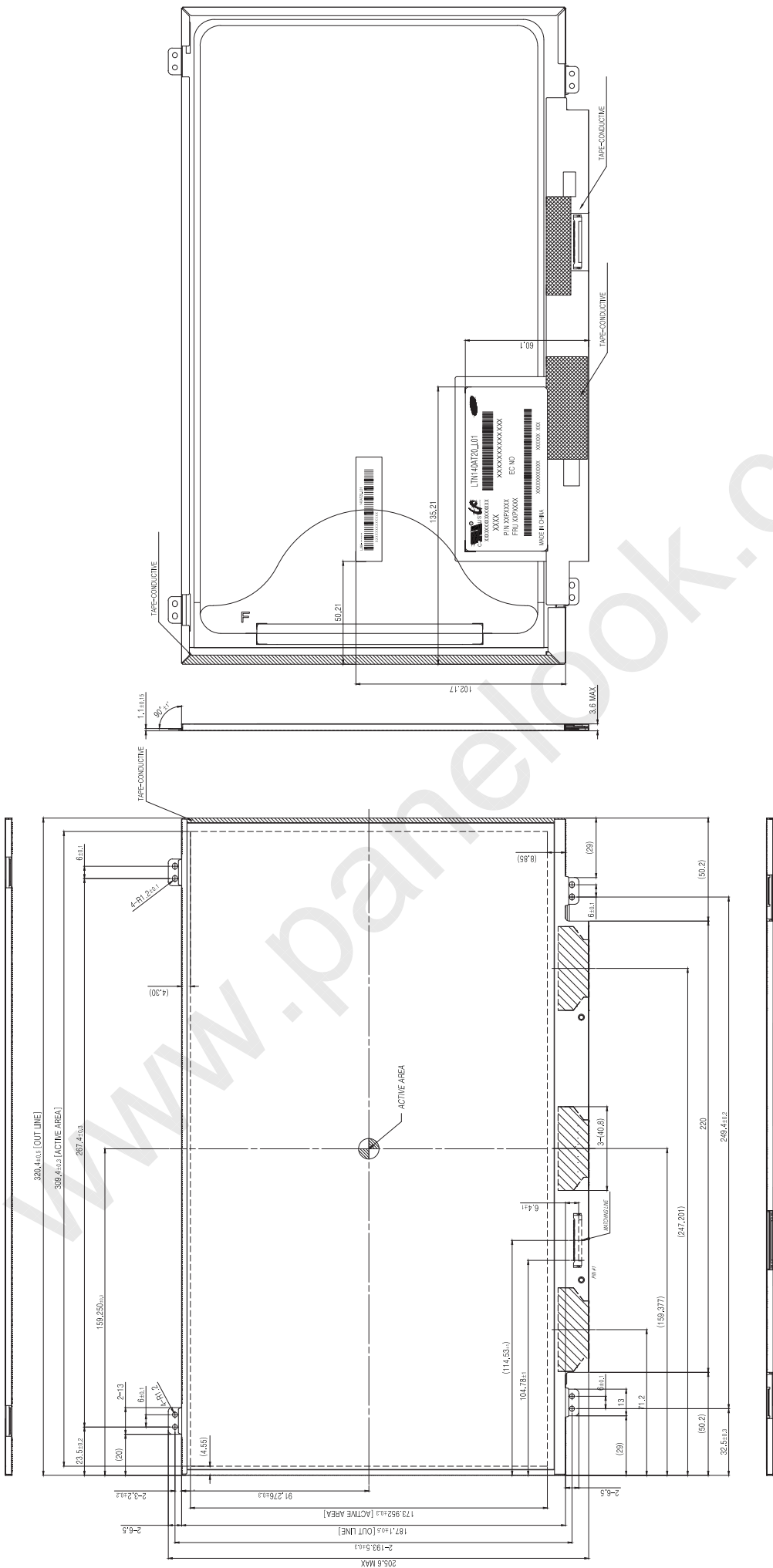
7. Mechanical Outline Dimension

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[Refer to the next page]

www.panelook.com

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★ NOTE

- 1. INPUT SIGNAL CONNECTOR TO BE SPECIFIED AS BELOW:
-MAKER / PART NO. : I-PEX / 20455-040E-02S
- 2. CALIPERS MEASURING FORCE :150 gf
- 3. UNDER MEASURING FORCE 30gf, POLARIZER IS HIGHER THAN COVER SURFACE.
- 4. WEIGHT : 320g Max.
- 5. IN ORDER TO AVOID IC DAMAGE, IT IS NOT ALLOW THAT OVERLAPPING OF CABLES OF ANTENNAS, CAMERA, WLAN, OVER THESE COF LOCATION.

LTN140AT20-L01

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REV.	DATE	DESCRIPTION OF REVISION				MODEL NAME	REASON	CHG. BY	
		UNIT	mm	DRAWN BY	CHECK BY				APPRO BY
SCALE		1 : 1	4.0.24			PART / SHEET NAME	SHEET 1		
ORIGINAL TOLERANCE		±0.05	11.05.25			OUTLINE DIMENSION			
						SPEC. NO.			
SAMSUNG ELECTRONICS									
LTN140AT20-L01									

8. PACKING

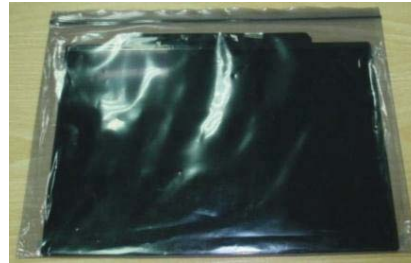
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1. CARTON(Internal Package)

(1) Packing Form

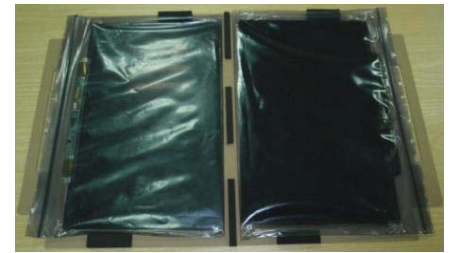
Corrugated Cardboard box and EPS form as shock absorber

(2) Packing Method



STEP 1

STEP 2



STEP 4

STEP 5

STEP 6



STEP 7

* included AL Bag in the outbox

- Note 1) Total Weight : Approximately (13.2) kg
 2) Acceptance number of piling : 30 sets
 3) Carton size : 495(W) x 423(D) x 310 (H)

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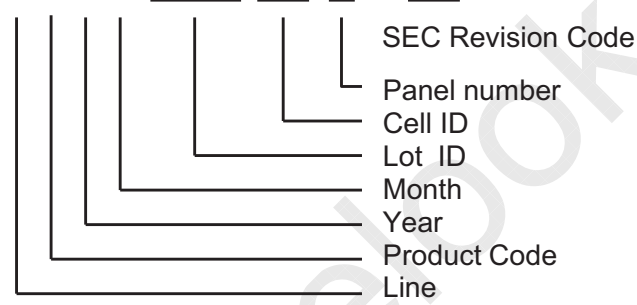
(3) Packing Material

No	Part name	Quantity
1	Static electric protective sack	(36) EA
2	Packing case (Inner box) included shock absorber	1 set
3	Pictorial marking	2
4	Carton	1 set

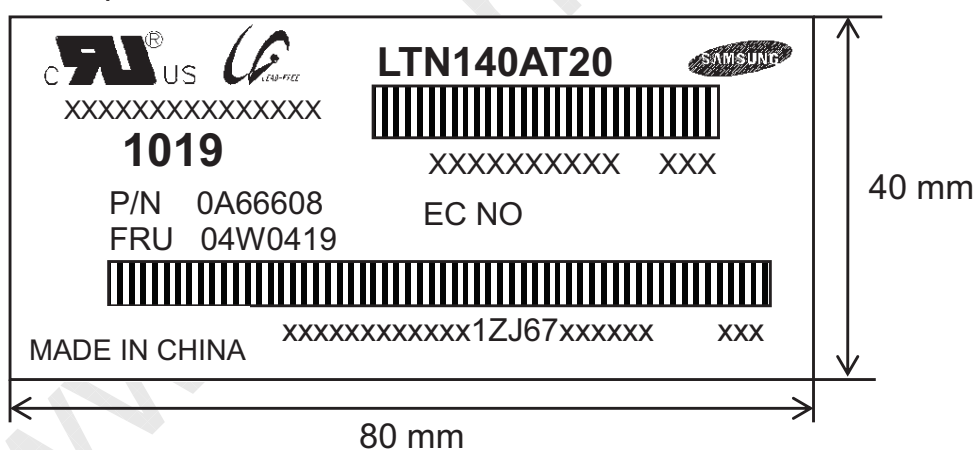
9. MARKINGS & OTHERS

A nameplate bearing followed by is affixed to a shipped product at the specified location on each product.

- (1) Parts number : LTN140AT20
- (2) Revision code : 3 letters
- (3) Lot number : X X X X XXX XX X **W01**



(4) Nameplate Indication

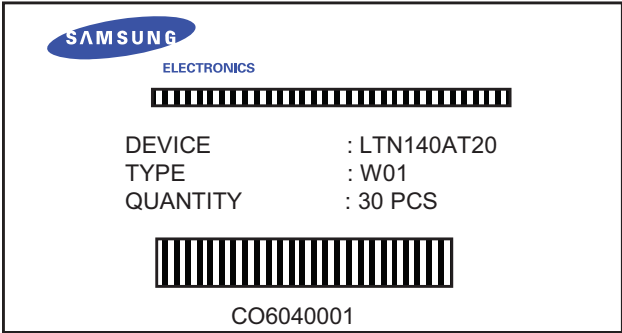


- TFT-LCD Product name : LTN140AT20
- USP code : XXXXXXXXXXXXX
- Lot number : XXXXXXXXXXX
- Revision Code : W01
- Inspected work week : 1019(2010 Year, 19nd week)
- P/N : Lenovo Part Number (0A66608)
- EC NO : Engineering Change Number (Blank)
- FRU : Field Replaceable Unit Part Number (04W0419)
- Header Code : 1ZJ67 (One Z J Six Seven)

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(5) Packing small box attach



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10. GENERAL PRECAUTIONS

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1. Handling

- (a) When the module is assembled, It should be attached to the system firmly using every mounting holes. Be careful not to twist and bend the modules.
- (b) Refrain from strong mechanical shock and / or any force to the module. In addition to damage, this may cause improper operation or damage to the module and back-light.
- (c) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch the surface harder than a HB pencil lead.
- (d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, Staining and discoloration may occur.
- (e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.
- (f) The desirable cleaners are water, IPA (Isoprophyl Alcohol) or Hexane.
Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.
- (g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth . In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.
- (h) Protect the module from static , it may cause damage to the C-MOS Gate Array IC.
- (i) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (j) Do not disassemble the module.
- (k) Do not pull or fold the lamp wire.
- (l) Do not adjust the variable resistor which is located on the back side.
- (m) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
- (n) Pins of I/F connector shall not be touched directly with bare hands.

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2. STORAGE

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- (a) Do not leave the module in high temperature, and high humidity for a long time.
It is highly recommended to store the module with temperature from 5 to 40 °C and relative humidity of less than 70%.
- (b) Do not store the TFT-LCD module in direct sunlight.
- (c) The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.
- (d) Storage period is recommended not to exceed 1 year.

3. OPERATION

- (a) Do not connect, disconnect the module in the “Power On” condition.
- (b) Power supply should always be turned on/off by following item 6.3
“Power on/off sequence”.
- (c) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (d) The FPC cable between the LED chips and its converter power supply shall be a minimized length and be connected directly. The longer cable between the back-light and the converter may cause lower luminance of light source (LED).
- (e) The standard limited warranty is only applicable when the module is used for general notebook applications. If used for purposes other than as specified, SEC is not to be held reliable for the defective operations. It is strongly recommended to contact SEC to find out fitness for a particular purpose.

4. OTHERS

- (a) Ultra-violet ray filter is necessary for outdoor operation.
- (b) Avoid condensation of water. It may result in improper operation or disconnection of electrode.
- (c) Do not exceed the absolute maximum rating value. (the supply voltage variation, input voltage variation, variation in part contents and environmental temperature, so on)
Otherwise the module may be damaged.
- (d) If the module displays the same pattern continuously for a long period of time, it can be the situation when the image “sticks” to the screen.
- (e) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

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11. EDID

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Address (HEX)	FUNCTION	Value HEX	BIN	DEC	ASCII or Data	Notes
00	Header	00	00000000	0		EDID Header
01		FF	11111111	255		
02		FF	11111111	255		
03		FF	11111111	255		
04		FF	11111111	255		
05		FF	11111111	255		
06		FF	11111111	255		
07		00	00000000	0		
08	ID Manufacturer Name	4C	01001100	76	S	3 character ID
					E	
09		A3	10100011	163	C	"SEC"
0A	ID Product Code	4C	01001100	76	[L]	#HD LED
0B		41	01000001	65	[A]	
0C	32-bit serial no.	00	00000000	0		
0D		00	00000000	0		
0E		00	00000000	0		
0F		00	00000000	0		
10	Week of manufacture	00	00000000	0		
11	Year of manufacture	14	00010100	20	2010	2010
12	EDID Structure Ver.	01	00000001	1	1	EDID Ver. 1.0
13	EDID revision #	03	00000011	3	3	EDID Rev. 3
14	Video input definition	80	10000000	128		
15	Max H image size	1F	00011111	31	31	31 cm(approx)
16	Max V image size	11	00010001	17	17	17 cm(approx)
17	Display Gamma	78	01111000	120	2.2	Gamma 2.2
18	Feature support	EA	11101010	234		
19	Red/green low bits	87	10000111	135		10000111
1A	Blue/white low bits	F5	11110101	245		11111110
1B	Red x/ high bits	94	10010100	148	0.580	Red x 0.580= 10010100
1C	Red y	57	01010111	87	0.340	Red y 0.340= 01010111
1D	Green x	4F	01001111	79	0.310	Green x 0.310= 01001111
1E	Green y	8C	10001100	140	0.550	Green y 0.550= 10001100
1F	Blue x	27	00100111	39	0.155	Blue x 0.155= 00100111
20	Blue y	27	00100111	39	0.155	Blue y 0.155= 00100111
21	White x	50	01010000	80	0.313	White x 0.313= 01010000
22	White y	54	01010100	84	0.329	White y 0.329= 01010100
23	Established timing 1	00	00000000	0		
24	Established timing 2	00	00000000	0		
25	Established timing 3	00	00000000	0		
26	Standard timing #1	01	00000001	1		not used
27		01	00000001	1		
28	Standard timing #2	01	00000001	1		not used
29		01	00000001	1		
2A	Standard timing #3	01	00000001	1		not used
2B		01	00000001	1		
2C	Standard timing #4	01	00000001	1		not used
2D		01	00000001	1		
2E	Standard timing #5	01	00000001	1		not used
2F		01	00000001	1		
30	Standard timing #6	01	00000001	1		not used
31		01	00000001	1		
32	Standard timing #7	01	00000001	1		not used
33		01	00000001	1		
34	Standard timing #8	01	00000001	1		not used
35		01	00000001	1		

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36	Detailed timing/monitor descriptor #1	41	01000001	65	72.33	Main clock= 72.33 MHz (@60Hz)
37		1C	00011100	28		
38		56	01010110	86	1366	Hor active=683*2 pixels
39		A0	10100000	160	160	Hor blanking=160pixels
3A		50	01010000	80		4bit : 4bit
3B		00	00000000	0	768	Vertical active=768 lines
3C		16	00010110	22	22	Vertical blanking=22 lines
3D		30	00110000	48		4bit : 4bit
3E		30	00110000	48	48	Hor sync. Offset=48 pixels
3F		20	00100000	32	32	H sync. Width=32 pixels
40		25	00100101	37	2	V sync. Offset=2 lines
					5	V sync. Width=5 lines
41		00	00000000	0		2bit : 2bit :2bit :2bit
42		35	00110101	53	309	H image size= 309 mm(approx)
43		AE	10101110	174	174	V image size = 174 mm(approx)
44		10	00010000	16		
45		00	00000000	0		No Horizontal Border
46		00	00000000	0		No Vertical Border
47		19	00011001	25		
48	Detailed timing/monitor descriptor #2	00	00000000	0		Manufacturer Specified (Timing)
49		00	00000000	0		
4A		00	00000000	0		
4B		0F	00001111	15		
4C		00	00000000	0		
4D		00	00000000	0		Value=HSPWmin / 2
4E		00	00000000	0		Value=HSPWmax / 2
4F		00	00000000	0		Value=Thbpmin / 2
50		00	00000000	0		Value=Thbpmax / 2
51		00	00000000	0		Value=VSPWmin / 2
52		00	00000000	0		Value=VSPWmax / 2
53		00	00000000	0		Value=Tvbpmin / 2
54		00	00000000	0		Value=Tvbpmax / 2
55		25	00100101	37		Thpmin=value*2 + HA pixelclks
56		D9	11011001	217		Thpmax=value*2 + HA pixelclks
57		06	00000110	6		Tvpmin=value*2 + VA lines
58		6A	01101010	106		Tvpmax=value*2 + VA lines
59		00	00000000	0		Module revision
5A	Detailed timing/monitor descriptor #3	00	00000000	0		ASCII Data String Tag
5B		00	00000000	0		
5C		00	00000000	0		
5D		FE	11111110	254		
5E		00	00000000	0		
5F		53	01010011	83	[S]	
60		41	01000001	65	[A]	
61		4D	01001101	77	[M]	
62		53	01010011	83	[S]	
63		55	01010101	85	[U]	
64		4E	01001110	78	[N]	
65		47	01000111	71	[G]	
66		0A	00001010	10	[^]	
67		20	00100000	32	[]	
68		20	00100000	32	[]	
69		20	00100000	32	[]	
6A		20	00100000	32	[]	
6B		20	00100000	32	[]	

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6C	Detailed timing/monitor descriptor #4	00	00000000	0		Monitor Name Tag (ASCII)
6D		00	00000000	0		
6E		00	00000000	0		
6F		FE	11111110	254		
70		00	00000000	0		
71		31	00110001	49	[1]	
72		34	00110100	52	[4]	
73		30	00110000	48	[0]	
74		41	01000001	65	[A]	
75		54	01010100	84	[T]	
76		32	00110010	50	[2]	
77		30	00110000	48	[0]	
78		2D	00101101	45	[-]	
79		4C	01001100	76	[L]	
7A		30	00110000	48	[0]	
7B		31	00110001	49	[1]	
7C		0A	00001010	10	[^]	
7D		20	00100000	32	[]	
7E	Extension Flag	00	00000000	0		
7F	Checksum	E1	11100001	225		

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